SPYWOLF

Security Audit Report

Completed on
November 14, 2023

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OVERVIEW

This audit has been prepared for **Carol Protocol** to review the main aspects of the project to help investors make make an informative decision during their research process.

You will find a a summarized review of the following key points:

- ✓ Contract's source code
- ✓ Owners' wallets
- ✓ Tokenomics
- ✓ Team transparency and goals
- ✓ Website's age, code, security and UX
- ✓ Whitepaper and roadmap
- ✓ Social media & online presence

> *The results of this audit are purely based on the team's evaluation and does not guarantee nor reflect the projects outcome and goal*
>
> \- SPYWOLF Team -

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Carol Protocol

PROJECT DESCRIPTION

According to their whitepaper:
CAROL is utilized in bonding mechanisms, allowing participants to lock their funds for a specific period in exchange for potential earnings and participation in protocol governance.
The CAROL token serves as a key component in liquidity pools, facilitating exchanges and creating sustainable market conditions for all participants. It serves as a central element within the network, providing unique opportunities for participation in bonding and liquidity provision.

Release Date: Launching November, 2023

Category: Liquidity Staking / Yield

CONTRACT 1 INFO (Main Contract)

Token Name
N/A

Symbol
N/A

Contract Address
0x26fe408BbD7A490fEB056DA8e2D1e007938E5685

Network
Binance Smart Chain

Language
Solidity

Deployment Date
Nov 13, 2023

Contract Type
Staking

Total Supply
N/A

Status
Not launched

TAXES

Buy Tax
Up to
30%

Sell Tax
none

Our Contract Review Process

The contract review process pays special attention to the following:

- ✓ Testing the smart contracts against both common and uncommon vulnerabilities
- ✓ Assessing the codebase to ensure compliance with current best practices and industry standards.
- ✓ Ensuring contract logic meets the specifications and intentions of the client.
- ✓ Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- ✓ Thorough line-by-line manual review of the entire codebase by industry experts.

Blockchain security tools used:

- OpenZeppelin
- Mythril
- Solidity Compiler
- Hardhat

TOKEN TRANSFERS STATS

Transfer Count	N/A
Uniq Senders	N/A
Uniq Receivers	N/A
Total Amount	N/A
Median Transfer Amount	N/A
Average Transfer Amount	N/A
First transfer date	N/A
Last transfer date	N/A
Days token transferred	N/A

SMART CONTRACT STATS

Calls Count	2
External calls	2
Internal calls	0
Transactions count	2
Uniq Callers	1
Days contract called	1
Last transaction time	2023-11-13 14:55:35 UTC
Created	2023-11-13 14:54:02 UTC
Create TX	0x498eed4e7db29bba51f265debe790131c6d9ff450b1fef41eb2c10b2d553ea4d
Creator	0xf993ac8c118e3cc16a8c37accfdd442b2fd66666

VULNERABILITY CHECK

Design Logic	Passed
Compiler warnings.	Passed
Private user data leaks	Passed
Timestamp dependence	Passed
Integer overflow and underflow	Passed
Race conditions and reentrancy. Cross-function race conditions	Passed
Possible delays in data delivery	Passed
Oracle calls	Passed
Front running	Passed
DoS with Revert	Passed
DoS with block gas limit	Passed
Methods execution permissions	Passed
Economy model	Passed
Impact of the exchange rate on the logic	Passed
Malicious Event log	Passed
Scoping and declarations	Passed
Uninitialized storage pointers	Passed
Arithmetic accuracy	Passed
Cross-function race conditions	Passed
Safe Zeppelin module	Passed
Fallback function security	Passed

THREAT LEVELS

When performing smart contract audits, our specialists look for known vulnerabilities as well as logical and access control issues within the code. The exploitation of these issues by malicious actors may cause serious financial damage to projects that failed to get an audit in time. We categorize these vulnerabilities by the following levels:

High Risk

Issues on this level are critical to the smart contract's performance/functionality and should be fixed before moving to a live environment.

Medium Risk

Issues on this level are critical to the smart contract's performance/functionality and should be fixed before moving to a live environment.

Low Risk

Issues on this level are minor details and warning that can remain unfixed.

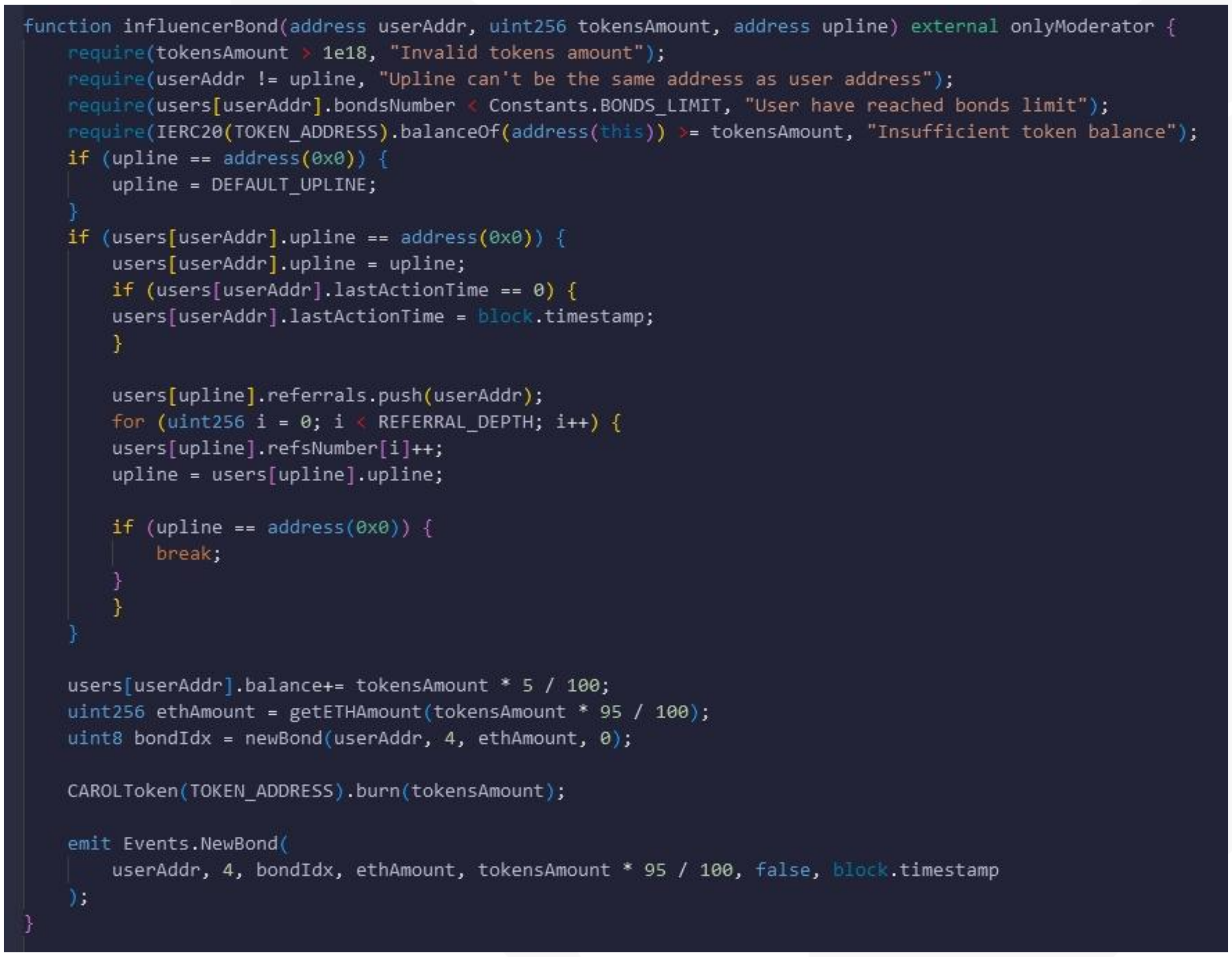
Informational

Information level is to offer suggestions for improvement of efficacy or security for features with a risk free factor.

FOUND THREATS

⚠ Medium Risk

Moderator can issue new bonds for free.
New bonds can be issued only when the contract’s current token balances are equal or higher than the new bond’s issue token amount.

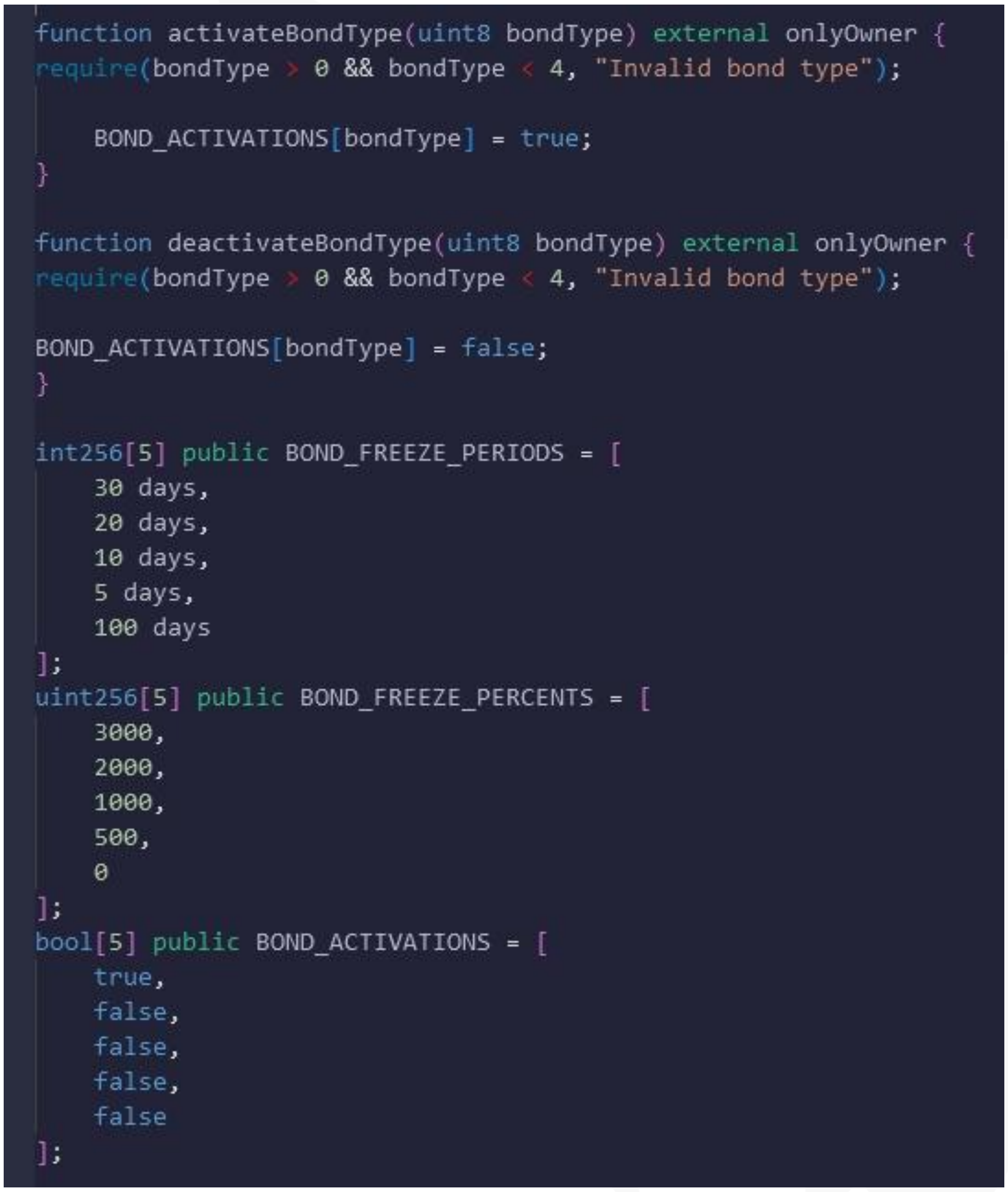


```
function influencerBond(address userAddr, uint256 tokensAmount, address upline) external onlyModerator {
    require(tokensAmount > 1e18, "Invalid tokens amount");
    require(userAddr != upline, "Upline can't be the same address as user address");
    require(users[userAddr].bondsNumber < Constants.BONDS_LIMIT, "User have reached bonds limit");
    require(IERC20(TOKEN_ADDRESS).balanceOf(address(this)) >= tokensAmount, "Insufficient token balance");
    if (upline == address(0x0)) {
        upline = DEFAULT_UPLINE;
    }
    if (users[userAddr].upline == address(0x0)) {
        users[userAddr].upline = upline;
        if (users[userAddr].lastActionTime == 0) {
        users[userAddr].lastActionTime = block.timestamp;
        }

        users[upline].referrals.push(userAddr);
        for (uint256 i = 0; i < REFERRAL_DEPTH; i++) {
        users[upline].refsNumber[i]++;
        upline = users[upline].upline;

        if (upline == address(0x0)) {
            break;
        }
        }
    }

    users[userAddr].balance+= tokensAmount * 5 / 100;
    uint256 ethAmount = getETHAmount(tokensAmount * 95 / 100);
    uint8 bondIdx = newBond(userAddr, 4, ethAmount, 0);

    CAROLToken(TOKEN_ADDRESS).burn(tokensAmount);

    emit Events.NewBond(
        userAddr, 4, bondIdx, ethAmount, tokensAmount * 95 / 100, false, block.timestamp
    );
}
```

- Recommendation:
    - No one should be able to issue new bonds for free.

Informational

Owner can activate/deactivate bond types (1, 2 and 3), which are for 20 days, 10 days and 5 days periods respectively.
Bonds 0 and 4 (30 days and 100 days) cannot be influenced by owner
Every bond type have different ROI and freeze periods.

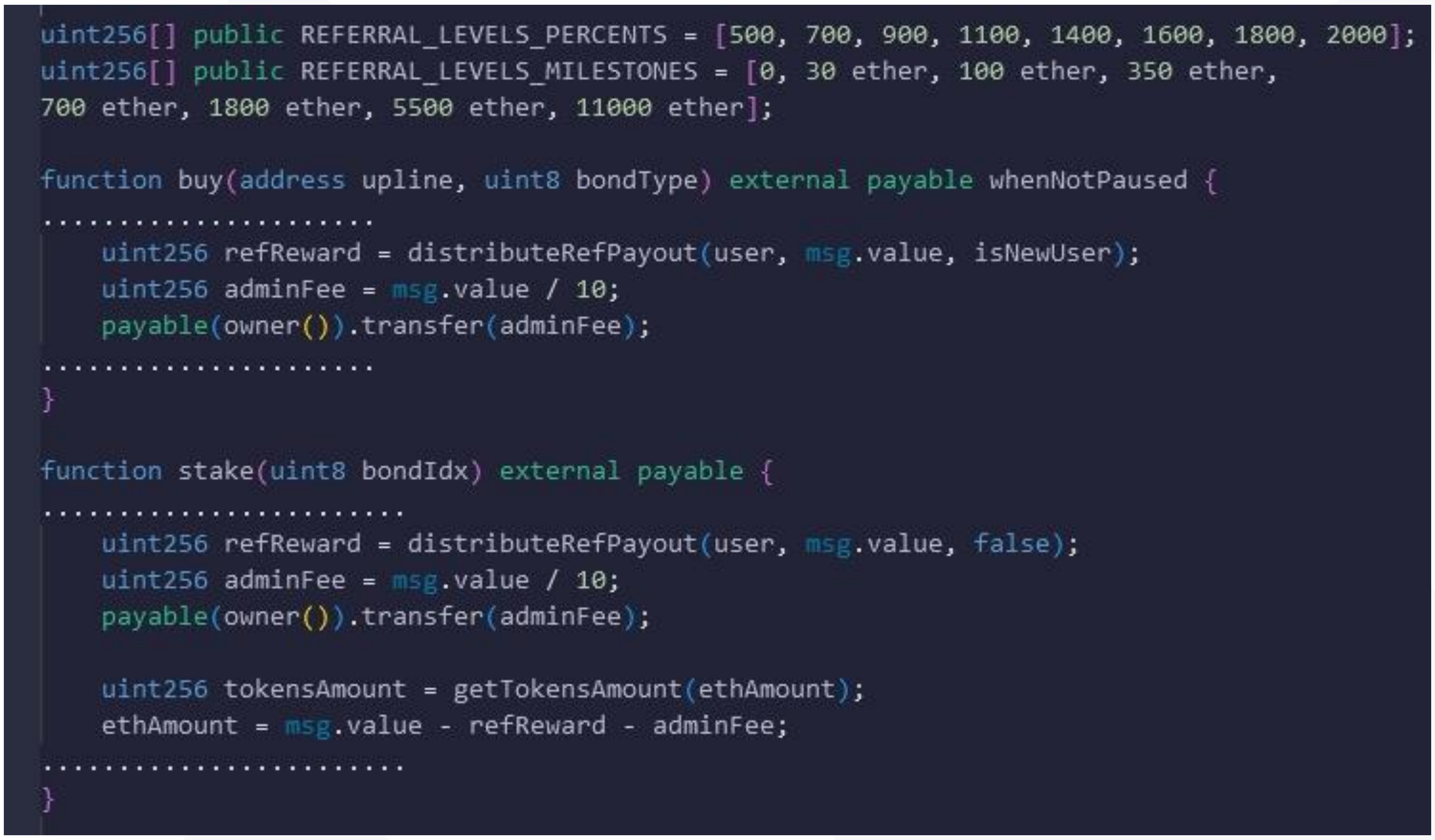


```
function activateBondType(uint8 bondType) external onlyOwner {
require(bondType > 0 && bondType < 4, "Invalid bond type");

    BOND_ACTIVATIONS[bondType] = true;
}

function deactivateBondType(uint8 bondType) external onlyOwner {
require(bondType > 0 && bondType < 4, "Invalid bond type");

BOND_ACTIVATIONS[bondType] = false;
}

int256[5] public BOND_FREEZE_PERIODS = [
    30 days,
    20 days,
    10 days,
    5 days,
    100 days
];
uint256[5] public BOND_FREEZE_PERCENTS = [
    3000,
    2000,
    1000,
    500,
    0
];
bool[5] public BOND_ACTIVATIONS = [
    true,
    false,
    false,
    false,
    false
];
```

Informational

There is 10% fee for bonds buy/staking that goes to the project's owner.

There is additional tax from 5% up to 20% (depending on users referrals and how much new capital they bring into the ecosystem) which goes towards referrals rewards.

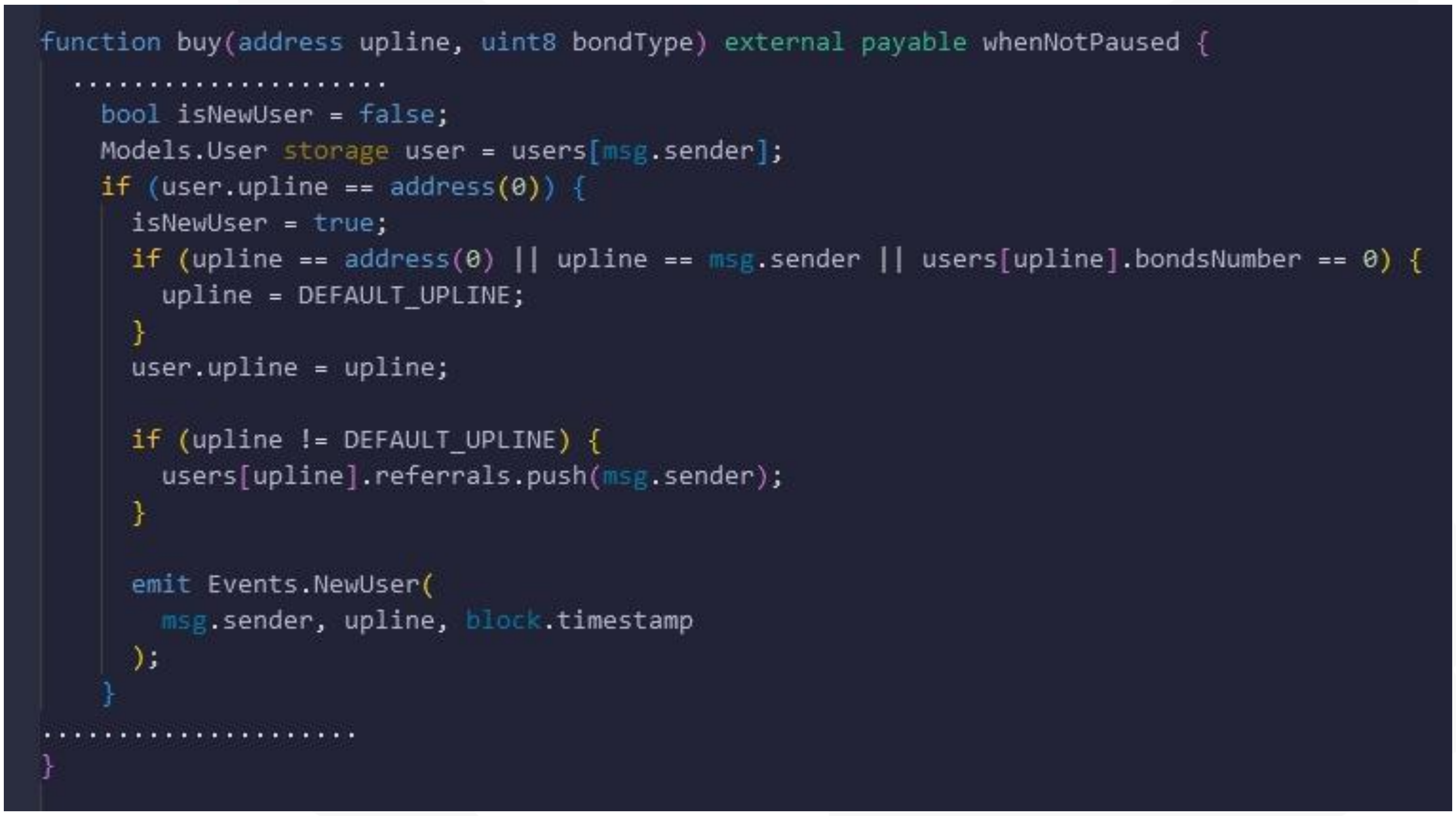


```
uint256[] public REFERRAL_LEVELS_PERCENTS = [500, 700, 900, 1100, 1400, 1600, 1800, 2000];
uint256[] public REFERRAL_LEVELS_MILESTONES = [0, 30 ether, 100 ether, 350 ether,
700 ether, 1800 ether, 5500 ether, 11000 ether];

function buy(address upline, uint8 bondType) external payable whenNotPaused {
......................
    uint256 refReward = distributeRefPayout(user, msg.value, isNewUser);
    uint256 adminFee = msg.value / 10;
    payable(owner()).transfer(adminFee);
......................
}

function stake(uint8 bondIdx) external payable {
........................
    uint256 refReward = distributeRefPayout(user, msg.value, false);
    uint256 adminFee = msg.value / 10;
    payable(owner()).transfer(adminFee);

    uint256 tokensAmount = getTokensAmount(ethAmount);
    ethAmount = msg.value - refReward - adminFee;
........................
}
```

Informational

When users set address they buy with for referral or address(0) or address that is not participating in the project yet (address with 0 bonds), the user becomes referral to default address assigned by project owner.

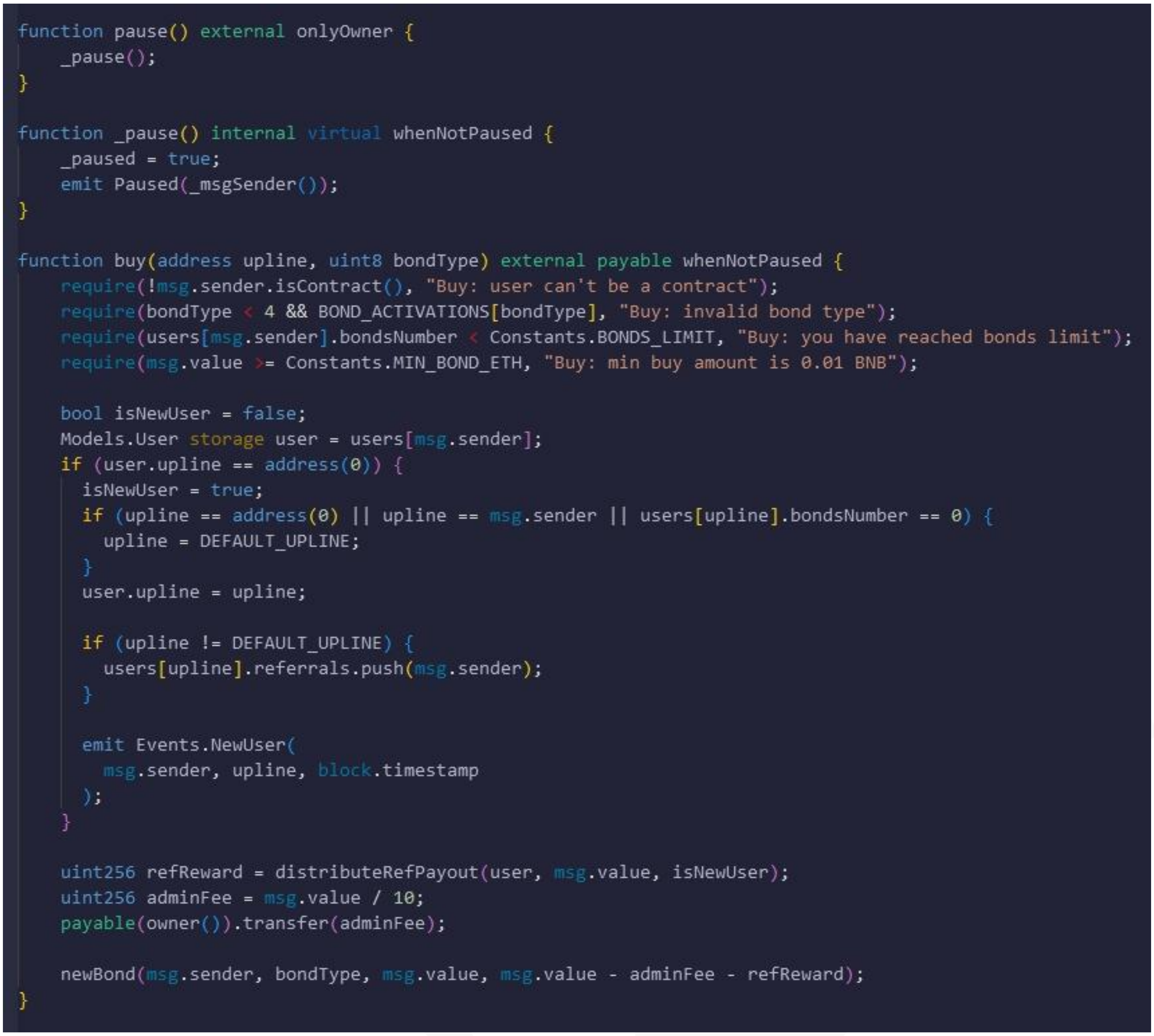
Referral rewards can go from 5% up to 20% from user’s deposited value based on how many total funds users collected from previous referrals.



```
function buy(address upline, uint8 bondType) external payable whenNotPaused {
  .....................
    bool isNewUser = false;
    Models.User storage user = users[msg.sender];
    if (user.upline == address(0)) {
      isNewUser = true;
      if (upline == address(0) || upline == msg.sender || users[upline].bondsNumber == 0) {
        upline = DEFAULT_UPLINE;
      }
      user.upline = upline;

      if (upline != DEFAULT_UPLINE) {
        users[upline].referrals.push(msg.sender);
      }

      emit Events.NewUser(
        msg.sender, upline, block.timestamp
      );
    }
.....................
}
```

Informational

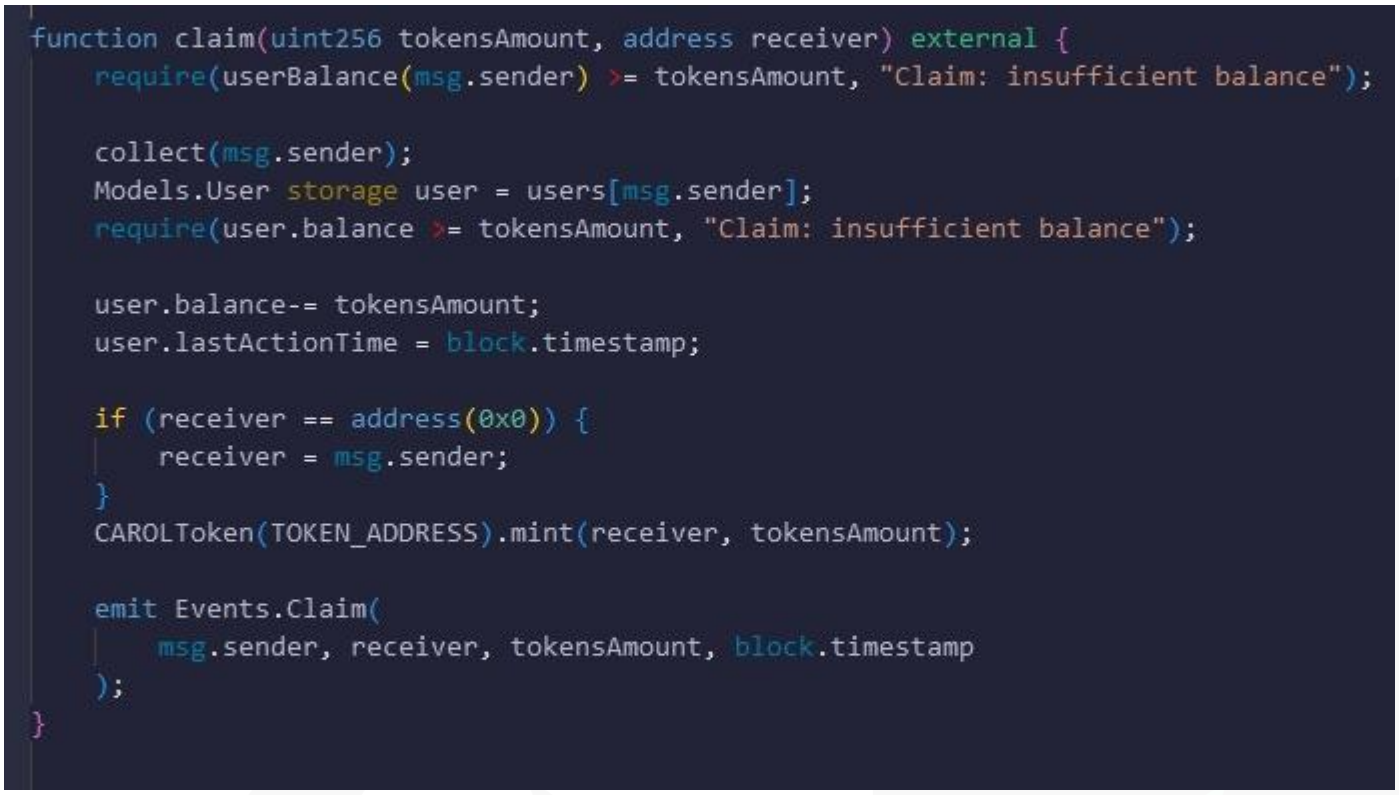
Owner can pause new buys.



```
function pause() external onlyOwner {
    _pause();
}

function _pause() internal virtual whenNotPaused {
    _paused = true;
    emit Paused(_msgSender());
}

function buy(address upline, uint8 bondType) external payable whenNotPaused {
    require(!msg.sender.isContract(), "Buy: user can't be a contract");
    require(bondType < 4 && BOND_ACTIVATIONS[bondType], "Buy: invalid bond type");
    require(users[msg.sender].bondsNumber < Constants.BONDS_LIMIT, "Buy: you have reached bonds limit");
    require(msg.value >= Constants.MIN_BOND_ETH, "Buy: min buy amount is 0.01 BNB");

    bool isNewUser = false;
    Models.User storage user = users[msg.sender];
    if (user.upline == address(0)) {
      isNewUser = true;
      if (upline == address(0) || upline == msg.sender || users[upline].bondsNumber == 0) {
        upline = DEFAULT_UPLINE;
      }
      user.upline = upline;

      if (upline != DEFAULT_UPLINE) {
        users[upline].referrals.push(msg.sender);
      }

      emit Events.NewUser(
        msg.sender, upline, block.timestamp
      );
    }

    uint256 refReward = distributeRefPayout(user, msg.value, isNewUser);
    uint256 adminFee = msg.value / 10;
    payable(owner()).transfer(adminFee);

    newBond(msg.sender, bondType, msg.value, msg.value - adminFee - refReward);
}
```

Informational

Users can claim for another address.
Users will send their rewards to the selected address.

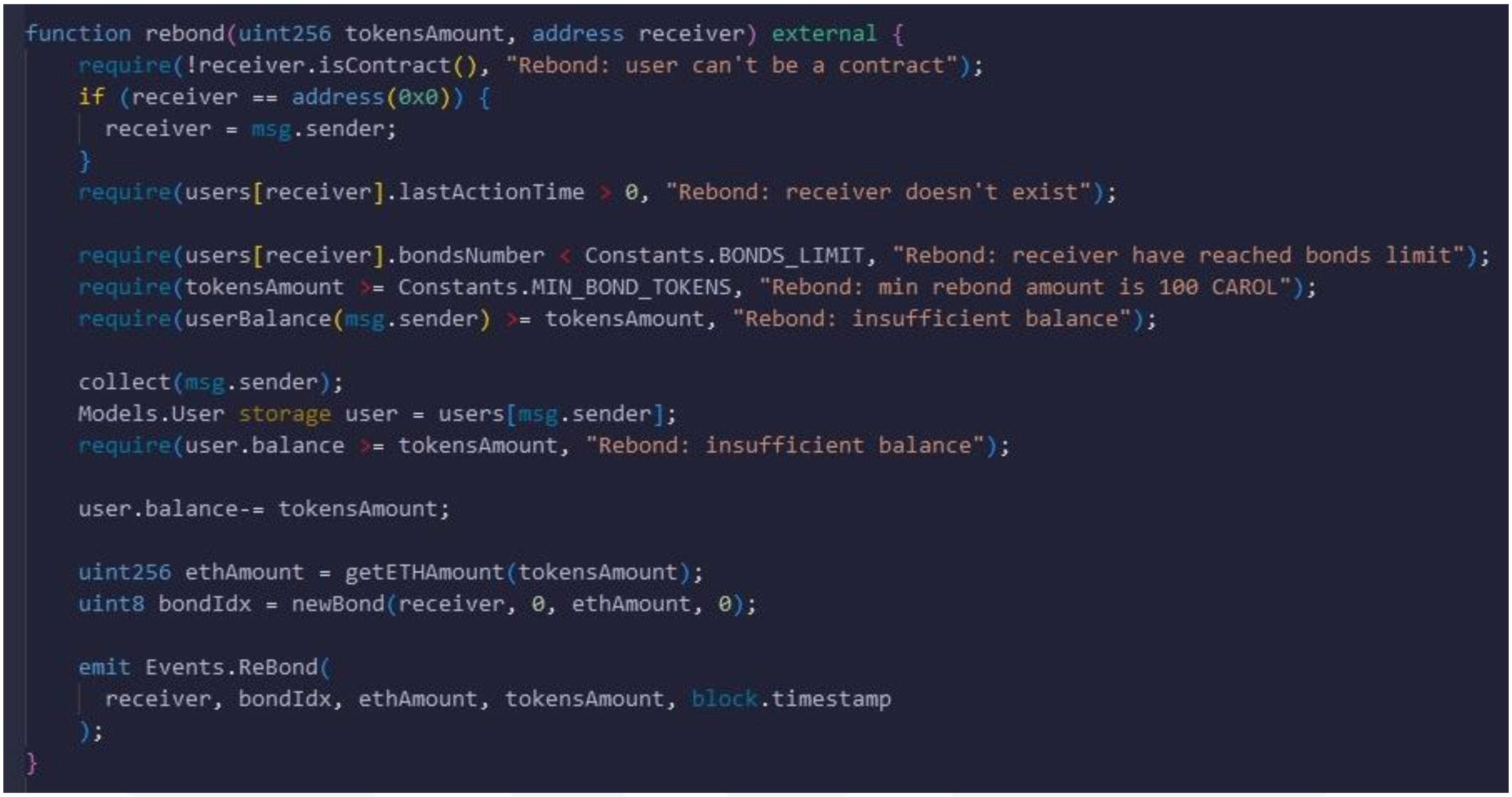


```
function claim(uint256 tokensAmount, address receiver) external {
    require(userBalance(msg.sender) >= tokensAmount, "Claim: insufficient balance");

    collect(msg.sender);
    Models.User storage user = users[msg.sender];
    require(user.balance >= tokensAmount, "Claim: insufficient balance");

    user.balance-= tokensAmount;
    user.lastActionTime = block.timestamp;

    if (receiver == address(0x0)) {
        receiver = msg.sender;
    }
    CAROLToken(TOKEN_ADDRESS).mint(receiver, tokensAmount);

    emit Events.Claim(
        msg.sender, receiver, tokensAmount, block.timestamp
    );
}
```

**When address different than address(0) is selected user will forfeit their rewards in favour of the selected address.*

Informational

***Users can rebond for another address.**
Receiver address must be already registered.

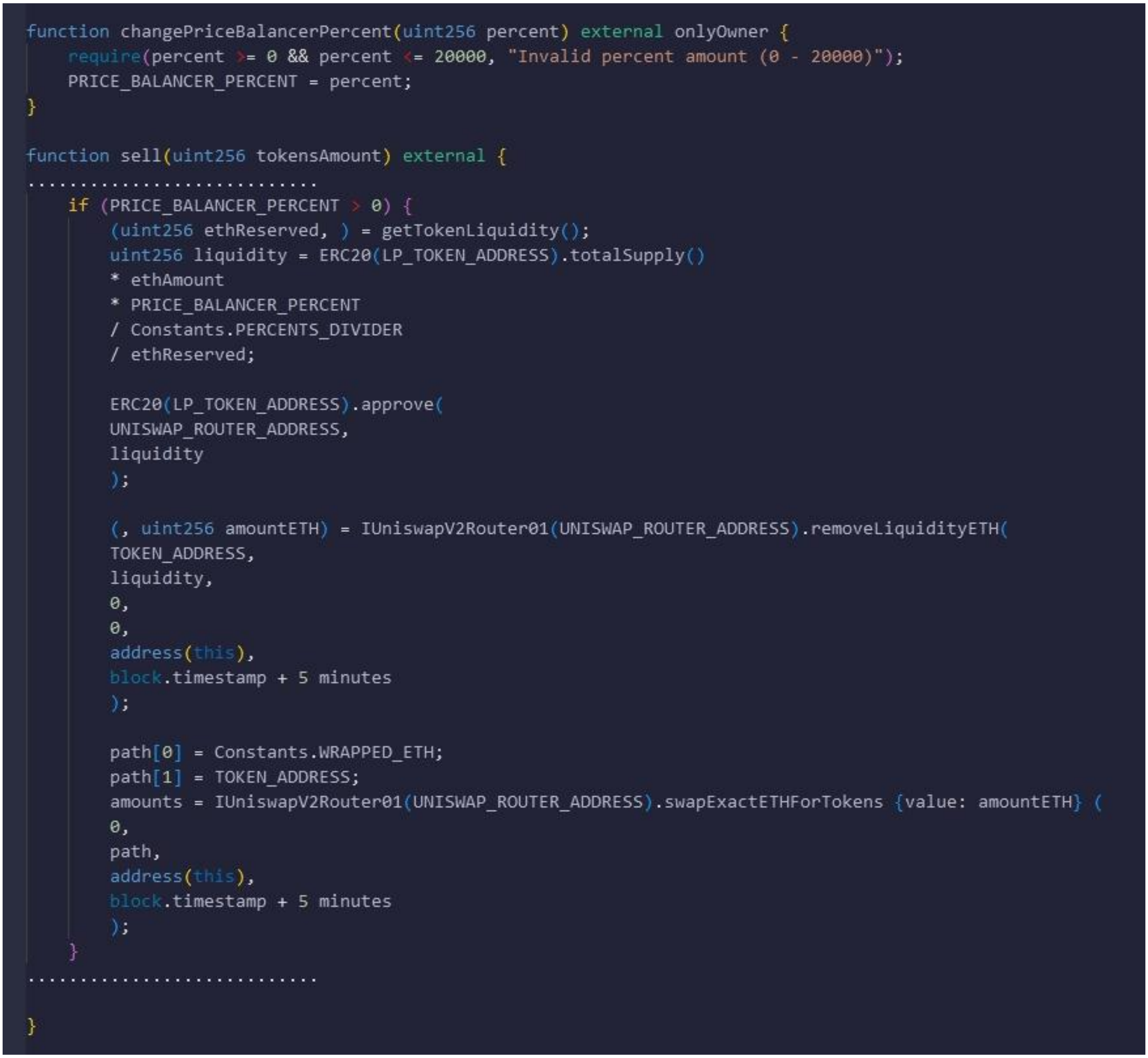


```
function rebond(uint256 tokensAmount, address receiver) external {
    require(!receiver.isContract(), "Rebond: user can't be a contract");
    if (receiver == address(0x0)) {
        receiver = msg.sender;
    }
    require(users[receiver].lastActionTime > 0, "Rebond: receiver doesn't exist");

    require(users[receiver].bondsNumber < Constants.BONDS_LIMIT, "Rebond: receiver have reached bonds limit");
    require(tokensAmount >= Constants.MIN_BOND_TOKENS, "Rebond: min rebond amount is 100 CAROL");
    require(userBalance(msg.sender) >= tokensAmount, "Rebond: insufficient balance");

    collect(msg.sender);
    Models.User storage user = users[msg.sender];
    require(user.balance >= tokensAmount, "Rebond: insufficient balance");

    user.balance-= tokensAmount;

    uint256 ethAmount = getETHAmount(tokensAmount);
    uint8 bondIdx = newBond(receiver, 0, ethAmount, 0);

    emit Events.ReBond(
        receiver, bondIdx, ethAmount, tokensAmount, block.timestamp
    );
}
```

**When address different than address(0) is selected user will forfeit their rebond in favour of the selected address.*

Informational

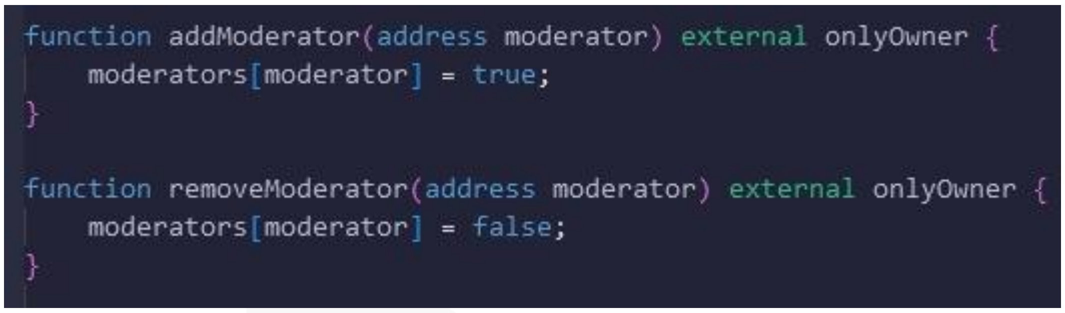
Owner can change PRICE_BALANCER_PERCENT's value.
This variable is responsible for the current sell ratio price.



```
function changePriceBalancerPercent(uint256 percent) external onlyOwner {
    require(percent >= 0 && percent <= 20000, "Invalid percent amount (0 - 20000)");
    PRICE_BALANCER_PERCENT = percent;
}

function sell(uint256 tokensAmount) external {
............................
    if (PRICE_BALANCER_PERCENT > 0) {
        (uint256 ethReserved, ) = getTokenLiquidity();
        uint256 liquidity = ERC20(LP_TOKEN_ADDRESS).totalSupply()
        * ethAmount
        * PRICE_BALANCER_PERCENT
        / Constants.PERCENTS_DIVIDER
        / ethReserved;

        ERC20(LP_TOKEN_ADDRESS).approve(
        UNISWAP_ROUTER_ADDRESS,
        liquidity
        );

        (, uint256 amountETH) = IUniswapV2Router01(UNISWAP_ROUTER_ADDRESS).removeLiquidityETH(
        TOKEN_ADDRESS,
        liquidity,
        0,
        0,
        address(this),
        block.timestamp + 5 minutes
        );

        path[0] = Constants.WRAPPED_ETH;
        path[1] = TOKEN_ADDRESS;
        amounts = IUniswapV2Router01(UNISWAP_ROUTER_ADDRESS).swapExactETHForTokens {value: amountETH} (
        0,
        path,
        address(this),
        block.timestamp + 5 minutes
        );
    }
............................

}
```

Informational

Owner can add/remove moderators.



```
function addModerator(address moderator) external onlyOwner {
    moderators[moderator] = true;
}

function removeModerator(address moderator) external onlyOwner {
    moderators[moderator] = false;
}
```

RECOMMENDATIONS FOR

GOOD PRACTICES

1 Consider fundamental tradeoffs

2 Be attentive to blockchain properties

3 Ensure careful rollouts

4 Keep contracts simple

5 Stay up to date and track development

Carol

GOOD PRACTICES FOUND

✓ The owner cannot set a transaction limit

CONTRACT 2 INFO (Token)

Token Name
CAROL

Symbol
CAROL

Contract Address
0xCFae100958A517919C583a2C36dED84cB6e7D217

Network
Binance Smart Chain

Language
Solidity

Deployment Date
Nov 13, 2023

Contract Type
Yes

Total Supply
2,000,000

Status
Not launched

TAXES

Buy Tax
N/A

Sell Tax
N/A

Our Contract Review Process

The contract review process pays special attention to the following:

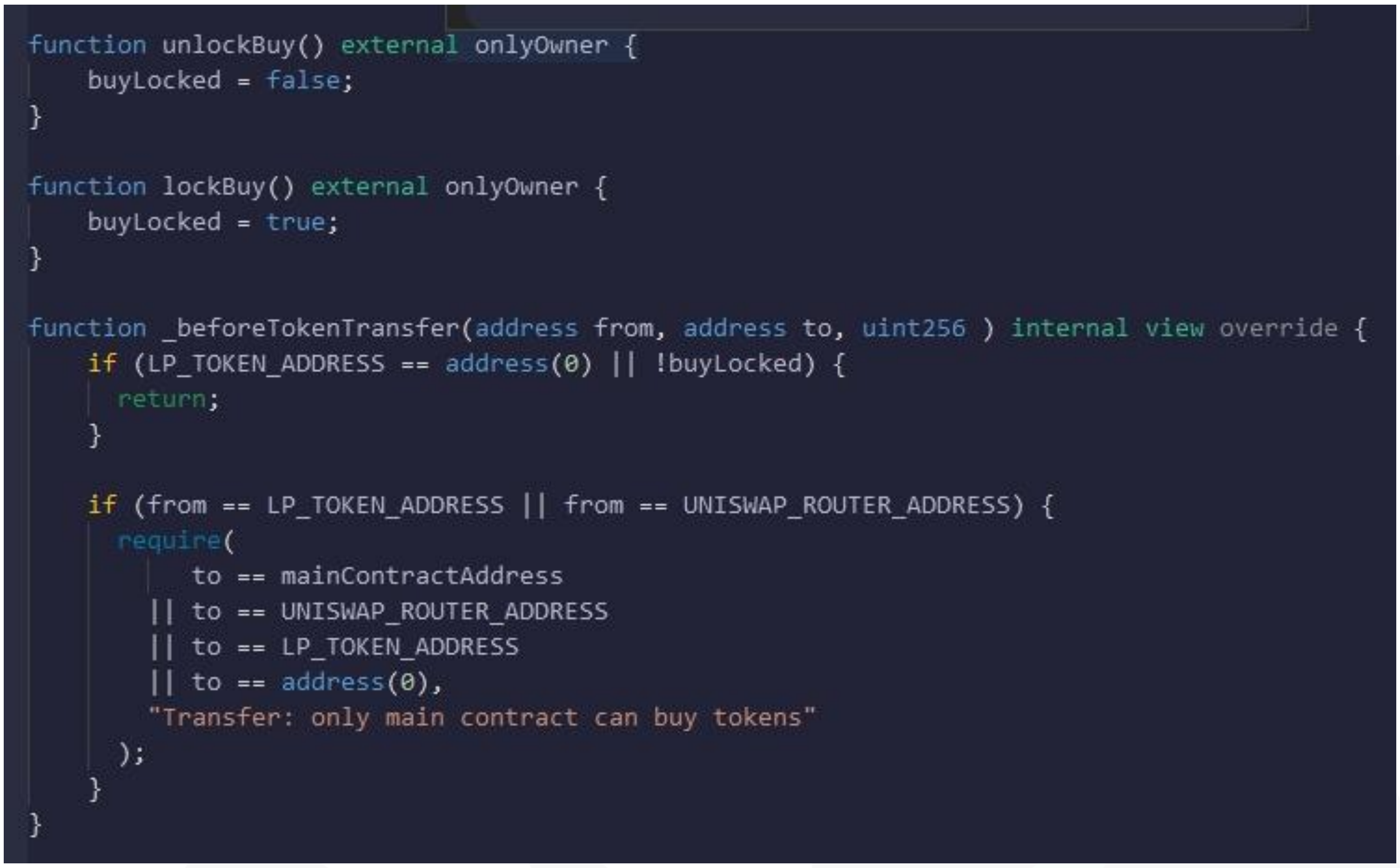
- ✓ Testing the smart contracts against both common and uncommon vulnerabilities
- ✓ Assessing the codebase to ensure compliance with current best practices and industry standards.
- ✓ Ensuring contract logic meets the specifications and intentions of the client.
- ✓ Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- ✓ Thorough line-by-line manual review of the entire codebase by industry experts.

Blockchain security tools used:

- OpenZeppelin
- Mythril
- Solidity Compiler
- Hardhat

Informational

Owner can enable/disable token buys.



```
function unlockBuy() external onlyOwner {
    buyLocked = false;
}

function lockBuy() external onlyOwner {
    buyLocked = true;
}

function _beforeTokenTransfer(address from, address to, uint256 ) internal view override {
    if (LP_TOKEN_ADDRESS == address(0) || !buyLocked) {
      return;
    }

    if (from == LP_TOKEN_ADDRESS || from == UNISWAP_ROUTER_ADDRESS) {
      require(
           to == mainContractAddress
        || to == UNISWAP_ROUTER_ADDRESS
        || to == LP_TOKEN_ADDRESS
        || to == address(0),
        "Transfer: only main contract can buy tokens"
      );
    }
}
```

RECOMMENDATIONS FOR

GOOD PRACTICES

1 Consider fundamental tradeoffs

2 Be attentive to blockchain properties

3 Ensure careful rollouts

4 Keep contracts simple

5 Stay up to date and track development

Carol

GOOD PRACTICES FOUND

✓ The owner cannot set a transaction limit

This is *ROI staking dapp with referral system that allows users to get up to 20% from each referral. When users choose to stake their capital (bonds/liquidity) they can earn up to 150% of their initial investment over time.

More information can be found in the project's documents page:
https://carol-8.gitbook.io/documentation/description-of-the-carol-token/bonding-and-liquidity-provision-mechanisms

ROI dapps are considered as high risk and can cause significant losses of capital.
***DYOR before investing in any.**

ROI - **Return **O**f **I**nvestment*
DYOR - **Do **Y**our **O**wn **R**esearch*

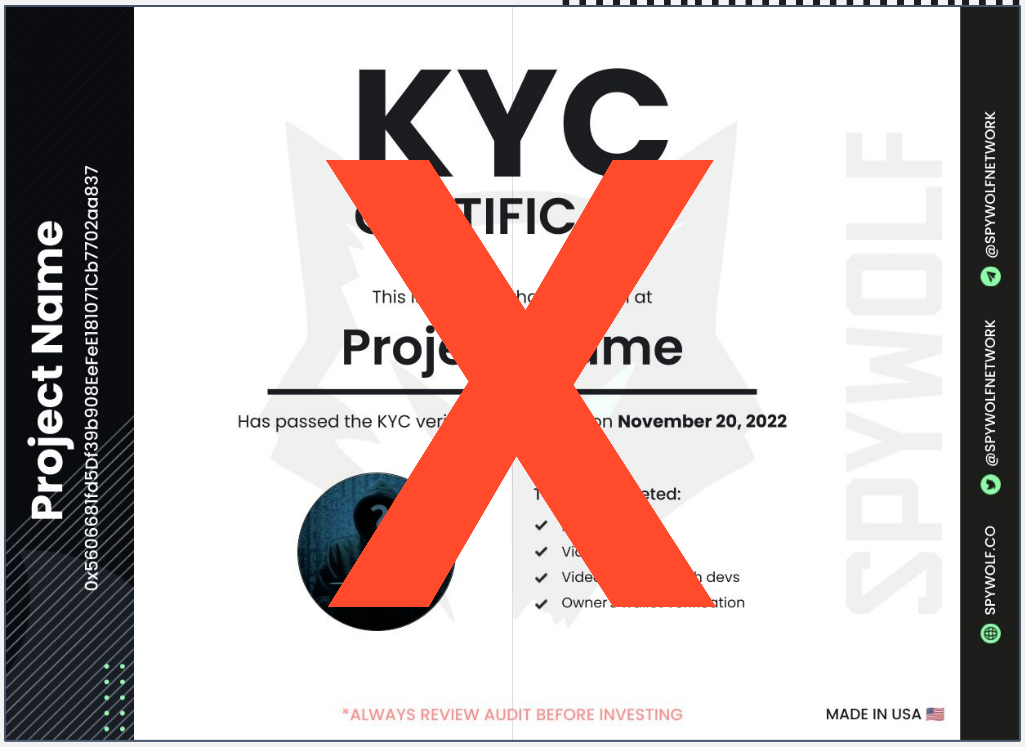
THE TEAM

⚠️ The team is annonymous

KYC INFORMATION

No KYC

We recommend the team to get a KYC in order to ensure trust and transparency within the community.



Project Name

0x5606681fd5Df39b908EeFeE181071Cb7702aa837

KYC

TIFIC

This ... at

Proj ... me

Has passed the KYC veri ... on November 20, 2022

...eted:

- ✓ Vi...
- ✓ Vide... devs
- ✓ Owner ... ation

SPYWOLF

*ALWAYS REVIEW AUDIT BEFORE INVESTING

MADE IN USA 🇺🇸

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WEBSITE

Website URL
https://carol.finance/

Domain Registry
https://www.namecheap.com/

Domain Expiration
2023-08-04

Technical SEO Test
Passed

Security Test
Passed. SSL certificate present

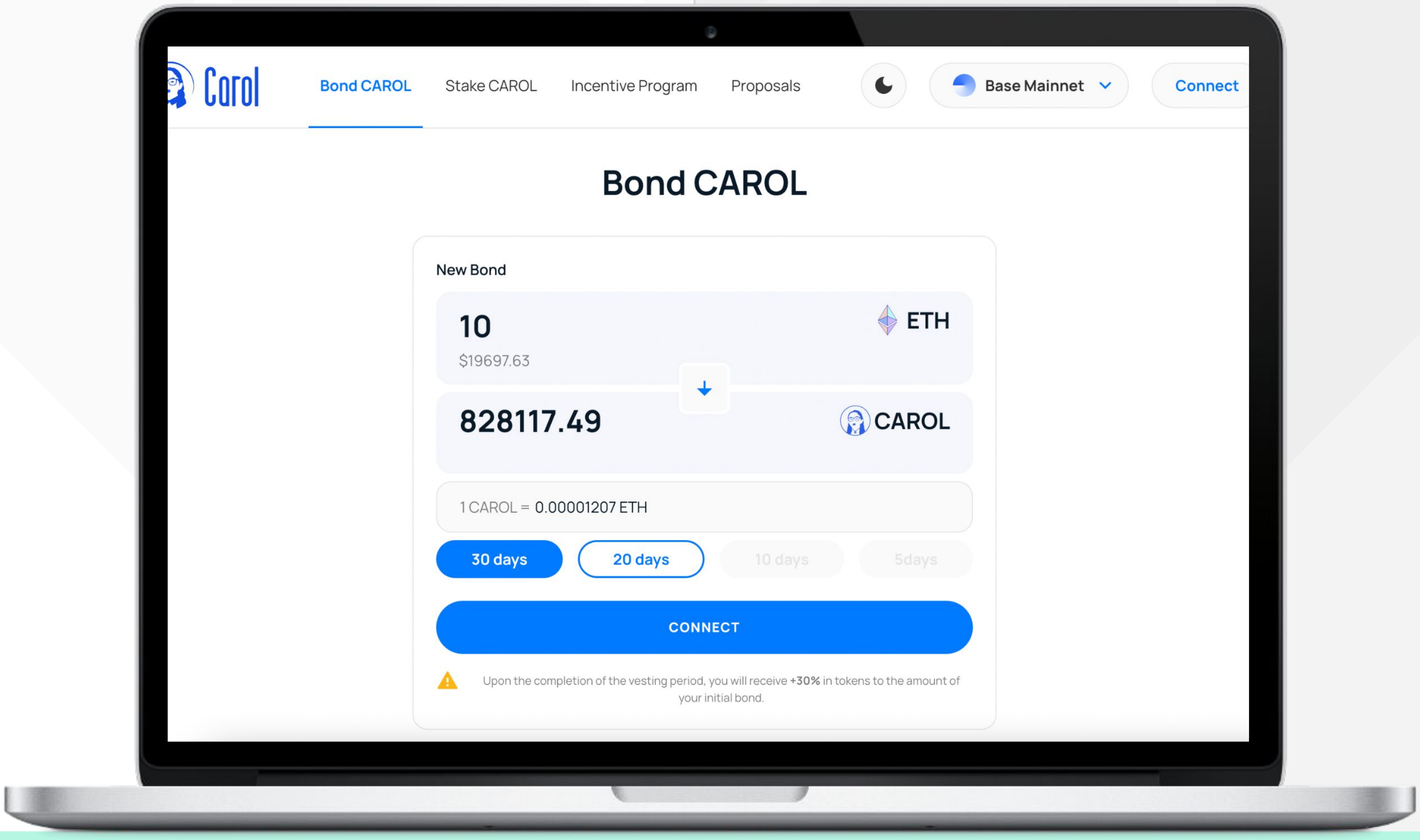
Design
Very nice overall design with appropriate color scheme and graphics.

Content
The information helps new investors understand what the product does right away. No grammar mistakes found
.

Whitepaper
Well written, explanatory

Roadmap
Yes

Mobile-friendly?
Yes



Bond CAROL

New Bond

10 ETH
$19697.63

828117.49 CAROL

1 CAROL = 0.00001207 ETH

Upon the completion of the vesting period, you will receive **+30%** in tokens to the amount of your initial bond.

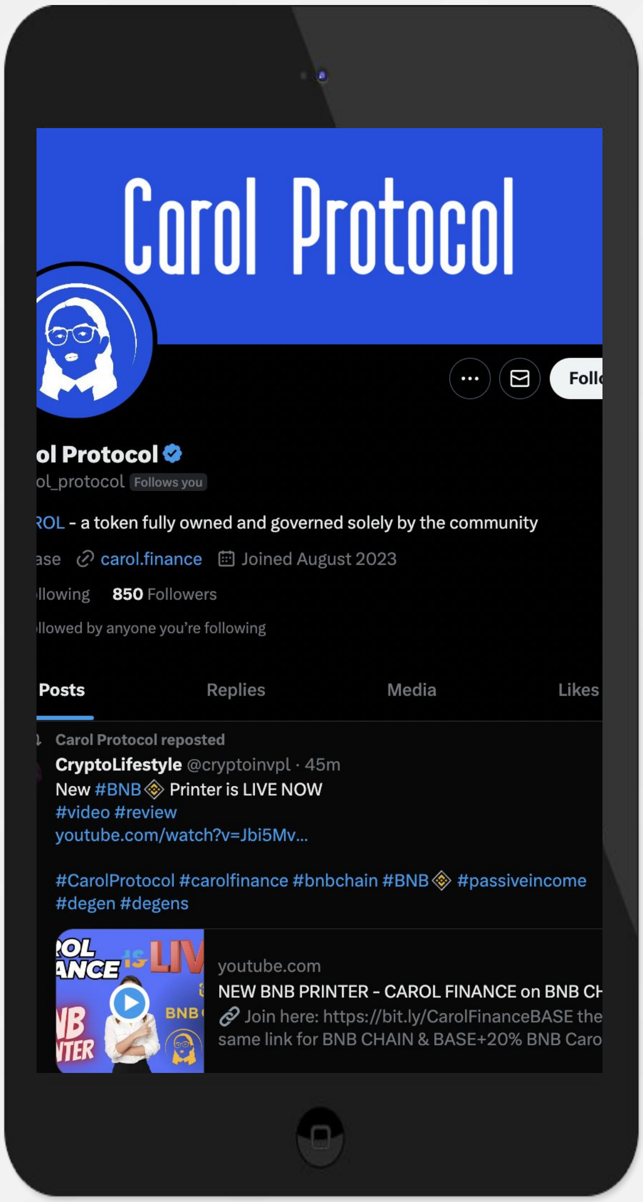
carol.finance

SOCIAL MEDIA

& ONLINE PRESENCE

ANALYSIS

Project's social media pages are active..



Carol Protocol

ol Protocol

ol_protocol Follows you

ROL - a token fully owned and governed solely by the community

ase carol.finance Joined August 2023

llowing 850 Followers

llowed by anyone you're following

Carol Protocol reposted

CryptoLifestyle @cryptoinvpl · 45m

New #BNB Printer is LIVE NOW
#video #review
youtube.com/watch?v=Jbi5Mv...

#CarolProtocol #carolfinance #bnbchain #BNB #passiveincome #degen #degens

youtube.com
NEW BNB PRINTER - CAROL FINANCE on BNB CH
Join here: https://bit.ly/CarolFinanceBASE the
same link for BNB CHAIN & BASE+20% BNB Caro

Twitter

@carol_protocol

- 850 followers
- Posts frequently
- Active

Discord

invite/XYddwyDhXq

- 157 members
- Active

Telegram

@CAROL_protocol_group

- 10 438 members
- Active members
- Active mods

Medium

- Not available

SPYWOLF

CRYPTO SECURITY

Audits | KYCs | dApps
Contract Development

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We are a growing crypto security agency offering audits, KYCs and consulting services for some of the top names in the crypto industry.

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- ✓ MILLIONS SAVED IN POTENTIAL FRAUD
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Disclaimer

This report shows findings based on our limited project analysis, following good industry practice from the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, overall social media and website presence and team transparency details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report.
While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the disclaimer below – please make sure to read it in full.

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